

NOVO POWER

ACC Workshop Presentation

12/5/2017

ENLIGHTENED GENERATION

Novo Biopower



- 28MW B&W BFB Boiler
- 24x7 365 Baseload Power Source
- PPA's with SRP and APS
- 38 Direct Employees
- >100 jobs Created indirectly
- >\$14M spent in local economy annually
- >210k MW's of Renewable power generated annually
- >200k Bone Dry Ton of Biomass burned annually
- >15k acres treated annually for Biomass removal
- In 2015, our Capacity Factor to Budget was 100.3%



Mr. Chairman, I believe water and fire are the defining environmental issues of the 21st century.”

- Senator John McCain, R Arizona @ Senate Hearing May 17, 2016

...If this is the case then Novo Power is the industrial and economic keystone to this effort in Arizona!

United States National Forests



- Over 25% (~1 Million Acres) of the Ponderosa Pine National Forest in Arizona has burned in catastrophic wildfire in the last 15 years.
 - The cost to suppress these two fires along with private property damage exceeded costs of \$250M.
 - In comparison, the San Juan fire of 2014 had similar potential but was limited to 7k acres and a cost of \$6.5M because it ran into acres where we had carried out restoration services.
- We received a letter of endorsement from the Apache Sitgreaves National Forest sharing that we save over \$1M annually in prescribed burning cost by removing and disposing of the biomass generated through restoration logging.
- We assist in restoration service on ~15k acres annually on wildlife habitat for endangered animals such as the Goshawk and Mexican Spotted Owl.

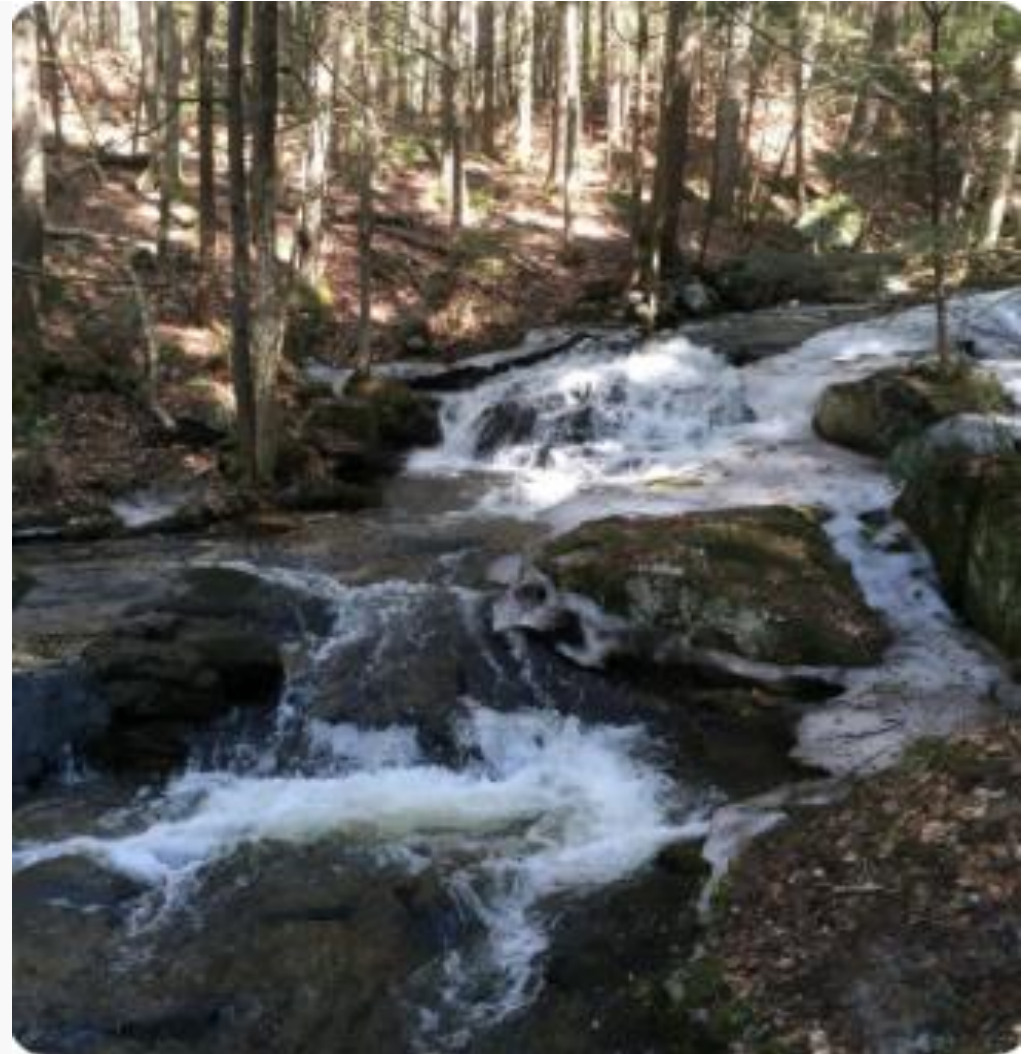
Watershed Preservation and Augmentation

"NAU and The Nature Conservancy recently produced some fascinating research which found thinning our forests over a 10-year period could produce up to 20% more water, on average, than if the forest wasn't thinned. Experts say that thinning just 30,000 acres in the Salt and Verde River Watersheds over the next 3-years would yield an [total expected] increase of 20,000 acre feet of water, thinning a full 250,000 acres by 2024 would result in an [total expected] increase of 100,000 acre feet of water."

- Senator John McCain

"The Strontia Springs reservoir in Colorado is a good example of the scale of costs we are trying to avoid in the C.C. Cragin Reservoir. The 1996 Buffalo Creek fire and 2002 Hayman fires burned areas in the watershed surrounding the Strontia Springs Reservoir, with subsequent storms washing timber, ash and sediment into the 7,900 AF reservoir (about half of Cragin's 15,000 AF capacity). The two fires combined burned 150,000 acres around the reservoir, resulting in 1 million cubic yards of sediment entering the reservoir. As a result of these fires Denver water spent \$45 million on erosion mitigation and \$17 million on dredging. The large costs to Denver Water to restore the reservoir after fires shows how important it is to invest to prevent fires in C.C. Cragin's watershed."

- Ronald Klawitter (Analyst at SRP)




Clean Air



Biomass facilities are considered carbon neutral facilities. The reason for this designation is that we are using active carbon in the environment rather than sequestered carbon, such as coal and natural gas which reintroduce carbon to the atmosphere.


Beyond the above there are other major benefits of biomass power generation to the environment and more specifically to air quality:

1. Methane is generated when biomass decays naturally in the woods. Methane is 25x more potent in capturing green house gases in the atmosphere than CO₂. When burned in a biomass facility, CO₂ is released instead of Methane.
2. By burning in a controlled and filtered environment, particulate matter emissions are reduced by 90-98%.
3. SO₂ emissions release acid into the environment and are a cause of acid rain. A Biomass plant emits less than 10% of SO₂ per megawatt in comparison to a coal powered facility.
4. NO_x emissions generally create the "haze" seen in major cities and around industrial facilities. A biomass plant emits less than 50% NO_x per megawatt in comparison to a coal powered facility.



Arizona White Mountain Communities

- Novo Power is a major employer in the White Mountain communities. Below are critical statistics on impact from 2016:
 - Novo Power Payroll with Benefits: \$3.4M
 - Wood Supplier Payments: \$7.9M
 - 3rd Party Services/Supplies: \$3.97M
- The Bureau of Economic Statistics states that a 1.33 revenue multiplier is appropriate for impact to the economics of the local communities:
 - \$27.8M Impact
- We employ ~40 high skilled employees, maintaining a skilled work force that is diminishing following the shut down of Catalyst Paper in 2012 and the pending shut down of significant capacity in the coal fleet of Northern Arizona.
- Novo Power is also a 50% owner of Novo Star Wood Products, a local sawmill. We have an additional 20 employees and revenues in excess of \$4.7M at NovoStar.



Arizona White Mountain Communities

- Tourism / Hunting / Fishing represent over \$225M in revenue in the White Mountains each year. These numbers are significantly diminished if we cannot protect the National Forest that draws the residents from the Phoenix Metropolitan area.
- We clear ~4000 acres of private grass land from invasive Juniper annually. We do this at no cost to the local ranchers which produces a \$2M benefit to the ranchers.
- In 2016 we provided a backhaul for White Mountain forest industries to ship material to the valley and return with a low value green waste from Phoenix. This saved ~\$300k in haul cost for the industry.
- We paid \$110k in property taxes to Navajo County.

Benefit to Major Utilities

- Biomass power is stable, baseload renewable power generation. This provides the following benefits:
 - Renewable baseload power generation w/Recs for portfolio standard requirements with no storage requirements.
- Novo Power produces reliable power for potential use in rural communities. This potentially assists with reduced wheeling costs to the load.
- Novo Power is a major consumer of power, with Parasitic power bills in excess of \$2.5M annually to our local Utility.



Novo Power's Vision:

"Lead the Profitable Restoration of Arizona's Forest"

- Novo Power has a proven track record of performance. We have been the best use for biomass in the State of AZ for the last ~5 years.
- Novo Power knows our National Forests and Grasslands and the process for removing and generating power from the residues created in them.
- We have built a model to utilize all parts of the tree to achieve the highest and best use.
- Novo Power is in negotiations on a 45MW "like new" facility that could be relocated to AZ for less than \$1.5M/MW Capital cost.
- Novo Power is prepared to offer PPA pricing, between \$100-\$130/MWH depending on the facility.

